First Report of Gastrointestinal Helminths from the Wokan Cannibal Frog, *Lechriodus melanopyga* (Amphibia: Limnodynastidae), from Papua New Guinea[1]

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Abstract: The initial gastrointestinal helminth list is established for *Lechriodus melanopyga* (Doria) from Papua New Guinea. Examination of the digestive tracts of 16 *L. melanopyga* from April–May ($n = 14$) and October ($n = 2$) revealed six helminth species: Digenea: *Mesocoelium monas;* Nematoda: *Aplectana macintoshii*, *Cosmocerca novaeguineae*, *Oswaldocruzia bakeri*, *Abbreviata* sp. (larvae in cysts); Acanthocephala: *Acanthocephalus bufonis. Cosmocerca novaeguineae* was present in the greatest numbers (171) and shared the highest prevalence (88%) with *Acanthocephalus bufonis. Lechriodus melanopyga* represents a new host record for each of these helminths. New Guinea is a new locality record for *Mesocoelium monas* and *Acanthocephalus bufonis.*

The family Limnodynastidae consists of eight genera with over 40 species, of which *Limnodynastes* and *Lechriodus* occur in both Australia and New Guinea; all other genera are restricted to Australia (Zug et al. 2001, Frost et al. 2006). The Wokan cannibal frog, *Lechriodus melanopyga* (Doria) is a medium-sized, dull brown frog rarely more than 50 mm long that ranges across New Guinea (Zweifel 1972, Günther 2003) and breeds in shallow forest swamps and puddles (Menzies 1976; F.K., pers. obs.). There are, to our knowledge, no published records of helminths from this species. The purpose of this note is to report the first helminth records from *L. melanopyga* as part of an ongoing survey of the helminths of the herpetofauna of Papua New Guinea.

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materials and methods

Sixteen *Lechriodus melanopyga* (mean snout-vent length, 50.0 ± 2.46 SD; range, 46.6–56.0 mm) were collected by hand by F.K. from 29 April to 2 May 2002 and 5 October 2002 at Duabo, 10.4184333° S, 150.3068333° E (WGS 84 datum), 300 m, Pini Range, Milne Bay, Papua New Guinea. Frogs were fixed in 10% neutral buffered formalin and preserved in 70% ethanol. The body cavity was opened by a lateral incision, and the digestive tract was removed, opened longitudinally, and examined under a dissecting microscope. Helminths were removed, placed on a glass slide in a drop of undiluted glycerol, covered with a coverslip, and examined under a compound microscope. Nematodes were identified from the glycerol slides; digeneans and acanthocephalans were regressively stained in Delafeld's hematoxylin, mounted in Canada balsam, and identified. Frogs were deposited in the Bernice P. Bishop Museum (BPBM), Honolulu, Hawai'i, as 15453–66 (April–May 2002) and 16259–60 (October 2002). Helminths were placed in vials of 70% ethanol and deposited in the United States National Parasite Collection (USNPC), Beltsville, Maryland, and the Bernice P. Bishop Museum (BPBM), Honolulu, Hawai'i: *Mesocoelium monas*, USNPC 97835, BPBM F239; *Aplectana macintoshii*, USNPC 97836, BPBM H143; *Cosmocerca novaeguineae*, USNPC 97837,

BPBM H144; *Oswaldocruzia bakeri*, USNPC 97838, BPBM H145; *Abbreviata* sp. (larva), USNPC 97839, BPBM H146; *Acanthocephalus bufonis*, USNPC 97840, BPBM H147.

RESULTS

One species of Digenea, *Mesocoelium monas* (Rudolphi, 1819) Freitas, 1957; four species of Nematoda, *Aplectana macintoshii* (Stewart, 1914) Travassos, 1931, *Cosmocerca novaeguineae* Moravec & Sey, 1990, *Oswaldocruzia bakeri* Moravec & Sey, 1986, *Abbreviata* sp. (larvae in cysts); and one species of Acanthocephala, *Acanthocephalus bufonis* (Shipley, 1903) Southwell & Macfie, 1925 were found.

Number of helminths, prevalences, mean intensity ± 1 SD, range, mean abundance ± 1 SD, and infection site are given in Table 1. *Cosmocerca novaeguineae* was present in the greatest numbers (171) and shared the highest prevalences (88%) with *Acanthocephalus bufonis*.

DISCUSSION

A total of 256 helminths was collected; of these, 35 (14%) were larval forms (*Abbreviata* sp.) not capable of reaching maturity in frogs; the other species were represented by various developmental stages including gravid individuals. There were six helminth species represented in the sample, but no individual host harbored more than four species. All frogs were infected: two (12%) harbored one species of helminth; seven (44%) harbored two species; six (38%) harbored three; and one (6%) harbored four species. There were 2.38 ± 0.2 (±1 SE) helminth species per infected frog and 16.0 ± 3.4 helminth individuals per infected frog. Aho (1990) compiled distributional patterns for frog helminths in general and reported the mean ± 1 SE as 3.54 ± 0.24 (range 0–9) per host species. The values reported herein are within the range of Aho (1990), although the mean infective rate is lower than Aho (1990) reported. The lower rate may be a reflection of regional differences in frog infection rates or something as simple as sample size differences.

Mesocoelium monas is known from fishes, amphibians, and reptiles (Goldberg et al. 2005*b*). It appears to be cosmopolitan in distribution. *Aplectana macintoshii* was previously found in the gecko *Cyrtodactylus louisiadensis* from New Guinea by Bursey et al. (2005). It is the most cosmopolitan member of the genus and has been reported from species of frogs, toads, lizards, and one species of snake;

TABLE 1

Number, Prevalence (Percentage), Mean Intensity ± 1 SD, Range, Mean Abundance ± 1 SD, and Infection Site for Gastrointestinal Helminths from 16 *Lechriodus melanopyga* from Papua New Guinea

Helminth Infection Site	Number	Prevalence (%)	Mean Intensity ± 1 SD	Range	Mean Abundance ± 1 SD
Digenea					
Mesocoelium monas Small intestine	4	6	4.0	—	0.25 ± 1.0
Nematoda					
Aplectana macintoshii Large intestine	8	13	4.0	—	0.50 ± 1.4
Cosmocerca novaeguineae Large intestine	171	88	12.2 ± 10.7	1–42	10.69 ± 10.9
Oswaldocruzia bakeri Small, large intestines	2	13	1.0	—	0.12 ± 0.3
Abbreviata sp. (larvae in cysts) Stomach wall	35	31	7.0 ± 6.5	1–18	2.19 ± 4.8
Acanthocephala					
Acanthocephalus bufonis Small intestine	36	88	2.6 ± 1.8	1–7	2.25 ± 1.9

it is known from Africa, China, Europe, Japan, India, South America, and Malaysia (Baker 1987, Goldberg et al. 1993). *Cosmocerca novaeguineae* was described from the ranid frog *Platymantis papuensis* from Papua New Guinea by Moravec and Sey (1990). *Oswaldocruzia bakeri* was described by Moravec and Sey (1986) from the microhylid frogs *Callulops stictogaster* and *Callulops wilhelmana* from Papua New Guinea. It was also found by Moravec and Sey (1986) in one other microhylid frog species from Papua New Guinea, *Callulops humicola*. Encysted larvae of *Abbreviata* sp. were reported in the gecko *Cyrtodactylus louisiadensis* from Papua New Guinea by Bursey et al. (2005) and are common in Australian lizards (Jones 1992, 1995*a*,*b*, Goldberg and Bursey 2001). *Acanthocephalus bufonis* was originally described from the toads *Bufo melanostictus* and *Bufo penangensis* from Thailand by Shipley (1903) and redescribed by Kennedy (1982) from *B. melanostictus* from Indonesia. It has been reported from Belau in the anuran *Platymantis pelewensis* by Bursey and Goldberg (2004); from China in *Rana formosus* and *R. nigromaculata* by Van Cleave (1937); from Hawai'i in *Chaunus marinus* (formerly *Bufo marinus*) by Barton and Pichelin (1999) and in *Rana rugosa* by Goldberg et al. (2005*a*); from Malaysia in *Bufo asper*, *Kaloula pulcra*, *Rana cancrivora*, *Rana chalconota*, *Rana erythraea*, *Rana macrodon*, and *Rana tigrina* by Yuen and Fernando (1967); as well as in lizards from Indonesia (*Takydromus sexlineatus*) by Kennedy (1982) and from Hawai'i (*Anolis sagrei*) by Goldberg and Bursey (2000). *Lechriodus melanopyga* represents a new host record for each of the helminths listed here. New Guinea is a new locality record for *Mesocoelium monas* and *Acanthocephalus bufonis*. Subsequent work is required to ascertain the diversity of helminths found in the amphibians and reptiles of Papua New Guinea.

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